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Abstract Title:

**Assessment of the vulnerability of water resources to seasonal fires
across the Northern sub-Saharan African region**

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ABSTRACT

The northern sub-Saharan African (NSSA) region, extending from the southern fringes of the Sahara to the Equator, and stretching west to east from the Atlantic to the Indian ocean coasts, plays a prominent role in the distribution of Saharan dust and other airborne matter around the region and to other parts of the world, the genesis of global atmospheric circulation, and the birth of such major (and often catastrophic) events as hurricanes. Therefore, this NSSA region represents a critical variable in the global climate change equation. Recent satellite-based studies have revealed that the NSSA region has one of the highest biomass-burning rates per unit land area among all regions of the world. Because of the high concentration and frequency of fires in this region, with the associated abundance of heat release and gaseous and particulate smoke emissions, biomass-burning activity is believed to be a major driver of the regional carbon, energy, and water cycles. We acknowledge that the rainy season in the NSSA region is from April to September while biomass burning occurs mainly during the dry season (October to March). Nevertheless, these two phenomena are indirectly coupled to each other through a chain of complex processes and conditions, including land-cover and surface-albedo changes, the carbon cycle, evapotranspiration, drought, desertification, surface water runoff, ground water recharge, and variability in atmospheric composition, heating rates, and circulation. In this presentation, we will examine the theoretical linkages between these processes, discuss the preliminary results based on satellite data analysis, and provide an overview of plans for more integrated research to be conducted over the next few years.